

Is pregnancy a teachable moment for diet and physical activity behaviour change? An interpretative phenomenological analysis of the experiences of women during their first pregnancy

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Abstract:	<p>Objectives Pregnancy may provide a 'teachable moment' for positive health behaviour change, as a time when women are both motivated towards health and in regular contact with healthcare professionals. This study aimed to investigate whether women's experiences of pregnancy indicate that they would be receptive to behaviour change during this period.</p> <p>Design Qualitative interview study.</p> <p>Methods Using Interpretative Phenomenological Analysis, this study details how seven women made decisions about their physical activity and dietary behaviour during their first pregnancy.</p> <p>Results Two women had required fertility treatment to conceive. Their behaviour was driven by anxiety and a drive to minimise potential risks to the pregnancy. This included detailed information-seeking and strict adherence to diet and physical activity recommendations. However, the majority of women described behaviour change as "automatic", adopting a new lifestyle immediately upon discovering their pregnancy. Diet and physical activity were influenced by what these women perceived to be normal or acceptable during pregnancy (largely based on observations of others) and internal drivers, including bodily signals and a desire to retain some of their pre-pregnancy self-identity. More reasoned assessments regarding benefits for them and their baby were less prevalent and influential.</p> <p>Conclusions Findings suggest that for women who conceived relatively easily, diet and physical activity behaviour during pregnancy is primarily based upon a combination of automatic judgements, physical sensations and perceptions of what pregnant women are supposed to do. Health professionals and other credible sources appear to exert less influence. As such, pregnancy alone may not create a 'teachable moment'.</p>
Additional Information:	
Question	Response

If you have any potentially competing interests to declare, please enter them in the box below. If you have no interests to declare, please enter 'none'.	None
Does this submission have any links or overlap with any other submitted or published manuscripts, for this or any other publication? (For example; as part of a long-term project, using a shared data set, a response to, or extension of, earlier work.) If yes, please give brief details. If no, please enter 'none'. Any overlap not declared and later discovered will result in the manuscript being withdrawn from consideration.	None
Please specify the word count of your manuscript (excluding the abstract, tables, figures and references).	6674

BJHP Response to reviewers April 2016

We would like to thank the editor and reviewers for reviewing our revised submission to the British Journal of Health Psychology, and for providing an opportunity to revise and resubmit our manuscript. We have further amended the manuscript to reflect the suggestions made, and hope that it is now considered suitable for publication.

Reviewer 1	Comments
The abstract should be revised to include a reference to the two groups of women to ensure consistency with the statement of contribution.	The abstract has been amended to reflect the different experiences of the two groups of women.
Reviewer 2	Comments
In your statement of contribution, the final sentence mentions 'insufficient risk perceptions'. It is slightly unclear whether you mean risk perceptions are insufficient for prompting behavioural change, or if there is a value judgement here in that parental cognitions are insufficient to meet their baby's health needs. I would alter the language slightly to avoid this being misunderstood as pejorative. 'Low-level' perceptions of risk rather than 'insufficient'?	We have amended the final line to: “This is due to a combination of a reliance on non-reflective decision-making, perception of low risk, and little change in affective response or self-concept.”
Please add a full stop after et al. throughout as this is an abbreviation. E.g. (McBride et al., 2013, p. 162).	Full stops have been added throughout.
Discrepancy in font size in first paragraph of procedure.	Font size has been corrected.
References: Some journal article refs have page numbers, others do not - add for all in consistent manner (remove 'pp' from some?).	pp has been removed. Page numbers have been added where available. A small number of references do not have page numbers as they are published in non-print journals (e.g. BMC Pregnancy & Childbirth) or have been published online ahead of the print version which is yet to be published.
Fishbein & Ajzen ref - extra full stop after year to be removed. Nicholson et al. ref has no full stop after year, same with Weir et al. and Wenneberg et al.	Full stops amended.
In Appendix 1: Map of Information Sources, please add 'e' to 'midwif_'.	Spelling corrected.

Running head: Diet and physical activity behaviour change in pregnancy.

Is pregnancy a teachable moment for diet and physical activity behaviour change?

An interpretative phenomenological analysis of the experiences of women during their first pregnancy.

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Statement of contribution

What is already known on this subject?

- Significant life events can be cues to action with relation to health behaviour change. However, much of the empirical research in this area has focused on negative health experiences such as receiving a false positive screening result and hospitalisation, and in relation to unequivocally negative behaviours such as smoking.
- It is often suggested that pregnancy, as a major life event, is a “teachable moment” for lifestyle behaviour change due to an increase in motivation towards health and regular contact with health professionals. However there is limited evidence for the utility of the TM model in predicting or promoting behaviour change.

What does this study add?

- Two groups of women emerged from our study. The women who had experienced difficulties in conceiving and had received fertility treatment, and those who had conceived without intervention. The former group’s experience of pregnancy was characterised by a sense of vulnerability and anxiety over sustaining the pregnancy which influenced every choice they made about their diet and physical activity.
- For the latter group, decisions about diet and physical activity were made immediately upon discovering their pregnancy, based upon a combination of automatic judgements, physical sensations and perceptions of what is normal or “good” for pregnancy.
- Among women with relatively trouble-free conception and pregnancy experiences the necessary conditions may not be present to create a

“teachable moment”. This is due to a combination of a reliance on non-reflective decision-making, perception of low risk, and little change in affective response or self-concept.

Is pregnancy a teachable moment for diet and physical activity behaviour change?

An interpretative phenomenological analysis of the experiences of women during their first pregnancy.

Objectives

Pregnancy may provide a 'teachable moment' for positive health behaviour change, as a time when women are both motivated towards health and in regular contact with healthcare professionals. This study aimed to investigate whether women's experiences of pregnancy indicate that they would be receptive to behaviour change during this period.

Design

Qualitative interview study.

Methods

Using Interpretative Phenomenological Analysis, this study details how seven women made decisions about their physical activity and dietary behaviour during their first pregnancy.

Results

Two women had required fertility treatment to conceive. Their behaviour was driven by anxiety and a drive to minimise potential risks to the pregnancy. This included detailed information-seeking and strict adherence to diet and physical activity recommendations. However, the majority of women described behaviour change as "automatic", adopting a new lifestyle immediately upon discovering their pregnancy. Diet and physical activity were influenced by what these women perceived to be normal or acceptable during pregnancy (largely based on observations of others) and internal drivers, including bodily signals and a desire to retain some of their pre-

pregnancy self-identity. More reasoned assessments regarding benefits for them and their baby were less prevalent and influential.

Conclusions

Findings suggest that for women who conceived relatively easily, diet and physical activity behaviour during pregnancy is primarily based upon a combination of automatic judgements, physical sensations and perceptions of what pregnant women are supposed to do. Health professionals and other credible sources appear to exert less influence. As such, pregnancy alone may not create a 'teachable moment'.

Introduction

It has been suggested that some naturally occurring health events such as a disease diagnosis or life transitions such as pregnancy may motivate individuals to spontaneously adopt risk-reducing health behaviours (McBride, Emmons & Lipkus, 2003). These teachable moments (TM) may provide health professionals and others with an opportunity to capitalise on this increased motivation, by providing advice and guidance related to the prominent health issue, which may then be translated into positive behaviour change.

The TM model draws on established constructs found in a number of widely accepted health psychology theories. These include Social Cognitive Theory (Bandura, 1977), the Theory of Reasoned Action (Fishbein & Ajzen, 1975) and the Health Belief Model (Hochbaum, 1958). The TM model has potential to illuminate how the interaction of these constructs along with a significant life change influence behaviour. Specifically, McBride et al., (2003) propose that three key constructs determine whether a cueing event is significant enough to be a TM. These are: “the extent to which the event (1) increases perceptions of personal risk and outcome expectancies, (2) prompts strong affective or emotional responses, and (3) redefines self-concept or social role.” (McBride et al., 2003, p. 162).

Despite this theorising, there is limited evidence for the utility of the TM model in predicting or promoting behaviour change. A review found that TMs had been poorly developed conceptually and operationally within the literature (Lawson & Flocke, 2009). For example, the term TM was often used synonymously with ‘opportunity’ or labelled retrospectively when behaviour change had occurred. Greater conceptual

development of this potentially useful idea would therefore be helpful in assessing its utility.

Empirically, the majority of research on significant life events as cues to action has focused on negative health experiences such as receiving a false positive screening result (Floyd, 2011) and hospitalisation (Wachsberg et al., 2014) rather than positive life transitions such as pregnancy, and in relation to unequivocally negative behaviours such as smoking (e.g. Flocke et al., 2014). By contrast, pregnancy is often posited as having the potential to generate a TM. For example, Phelan (2010) suggested that pregnancy may be an ideal time to promote healthy eating and physical activity, based on the expectation that women are likely to experience strong emotional responses to their pregnancy, such as elation and fear for the well-being of the foetus, in addition to an enhanced perception of risk to themselves and their baby of their lifestyle choices and changes to social identity including a transition to a maternal role for first time mothers and the need to be a role model for their child.

While a handful of qualitative studies have found high levels of motivation and commitment towards healthy diet and physical behaviours during pregnancy these also identified multiple barriers to women fulfilling their intentions, including; pregnancy 'symptoms', work and childcare (Weir et al., 2010), safety concerns (Bennett, McEwen, Hurd Clarke, Tamminen & Crocker, 2013) and physical restrictions due to bodily changes (Carolan, Gill & Steele, 2012; Hegaard, Kjaergaard, Damm, Petersson & Dykes, 2010). Thus, while the idea of taking advantage of the increased salience of health concerns is appealing, it is possible that other factors such as the emotional and psychological impact of these events, or a lack of physical or social opportunity to enact the desired behaviour may negate

the effect of this increased motivation (Olander, Darwin, Atkinson, Smith & Gardner, 2015). Additionally, women have reported a lack of comprehension of what was expected of them with regard to these behaviours, difficulty in making changes in a short amount of time, and struggling to refuse unhealthy food in social situations (Carolan et al., 2012). It is also important to note that advice from health professionals is not received in isolation, but will be evaluated and interpreted alongside pre-existing beliefs, advice from friends and family, and other influences such as the media (Olander, Atkinson, Edmunds & French, 2011; Clarke & Gross, 2004). Research thus far has failed to fully explore how individuals make sense of the information they receive at during significant life events, how they distinguish the relative importance and significance of messages, and if and how they make the transition from understanding a health threat to taking action.

The present study aimed to explore the potential of TMs, by in-depth examination of women's experiences of diet and physical activity behaviour change during their first pregnancy. This enabled a focus on a major life change: the transition to motherhood. By doing so we sought to identify the underlying factors which influenced their decision-making with regard to these behaviours.

Method

Participants

Seven women experiencing their first pregnancy were interviewed between 24 and 33 weeks gestation. Women who were pregnant for the first time were chosen as they would be making decisions about their diet and physical activity without the benefit of prior experience or established behaviour patterns. All participants were white, heterosexual, married or living with a partner and worked in a professional occupation (see Table 1). Ages ranged from 28 to 42 years. Examination of participants' weight and height (taken at the booking appointment in very early pregnancy) revealed that three participants were in the healthy weight range and four were in the overweight range for body mass index.

Procedure

Following institutional ethical approval, advertisements were posted on staff intranets at large local employers in the Midlands of England and on social networks.

Volunteers were sent a detailed information sheet by email which explained the aims of the study ("to understand what influences women's diet and physical activity behaviour during their first pregnancy") and their involvement (an interview lasting around 60 minutes). Written consent was provided by all participants prior to data collection.

Face to face interviews were conducted with five participants, either in the lead author's office or the participant's home. All interviews were conducted by the lead author, an experienced researcher in the field of maternal health behaviour change, with a post-graduate degree in Health Psychology and much prior experience of conducting qualitative interviews with pregnant women. Two participants were interviewed via video chat software. A flexible interview approach was taken, where women were encouraged to share their views and experiences in detail. All participants were asked to recall in detail examples of receiving or encountering advice or information regarding diet and physical activity, and to talk through their decision-making regarding these behaviours. Prompts were used to encourage participants to elaborate on topics of interest raised by them. Participants also completed a short task involving detailing all the sources of information and advice on these behaviours they had encountered during their pregnancy. Interviews were audio-recorded and transcribed verbatim.

Analysis

Interpretative Phenomenological Analysis (IPA: Smith, Flowers & Larkin, 2009) was adopted as a methodology well-suited to exploring the lived experience of pregnancy (Smith, 1999a,b). The goal of IPA is to examine how individuals make sense of their life experiences, while the analysts are said to be engaged in a double hermeneutic, as they aim to ascribe meaning to this sense-making. To achieve this, each transcript was individually read and re-read, followed by a process of line by line phenomenological (what elements of the experience are of importance to the participant) and interpretative (what meaning these experiences have for the

participant) coding of individual meaning units. Once all transcripts were analysed, summaries of each were written to identify patterns of meaning for each participant. These were then examined for common themes across participants and transcripts were re-examined for data relevant to those themes. Emergent themes were defined through an iterative process involving repeated discussion between co-authors, re-examination of the data and refinement of themes. During analysis the lead author's prior knowledge and experience informed interpretation. Reflexive notes were made throughout data collection and analysis as a means of recognising and critically examining assumptions and conclusions drawn during the analysis process.

Results

Four themes were generated: *Acceptance of the pregnancy*, *Influence of pre-conception experiences*, *Listening to your body versus following advice*, and *Retaining self versus selflessness*. Together these themes describe what it meant to participants to become a pregnant woman. This identity dominated how they made sense of being physically active and eating a healthy diet.

Acceptance of the pregnancy

Each woman described two distinct phases of their pregnancy. There was an initial acceptance of their pregnancy status on a rational level as a result of receiving a positive pregnancy test. This was followed later by a deeper acceptance of their pregnancy and gradual adjustment to their new identity as a mother. This latter phase was commonly described as "feeling pregnant" or "believing" in the

pregnancy, and often began following some visible evidence such as an ultrasound scan at 12 weeks gestation, or a defined bump. However, for all women, a *pregnancy lifestyle* was implemented immediately upon identification of the pregnancy. This new lifestyle involved elimination of toxins such as tobacco, alcohol and certain foods considered unsafe during pregnancy, but also included modification of physical activity routines and an increased focus on consuming nutritious foods. The features of this pregnancy lifestyle were similar for all women, based on their perceptions of what was appropriate or necessary for a pregnant woman. There was little evidence of a transition period or questioning of the value or validity of these perceptions. For example;

“Yeah automatically. Just automatic, as soon as you’ve done that test I knew I wasn’t going to drink so it wasn’t even a question.”

Scarlett

Scarlett’s use of the word “automatic” suggests that these changes are involuntary or performed without reflection. Scarlett herself referred to this as her “mother instinct” taking over, and described an immediate urge to protect her unborn child.

Alternatively, this automaticity could be a response to the social construction of a pregnant woman and what her lifestyle should be. For example, Hester’s description of her immediate behaviour changes after receiving the positive pregnancy test clearly delineates what to her was acceptable behaviour when she was not pregnant, and unacceptable once she knew she was pregnant. By ceasing these behaviours she begins enacting the role of a pregnant woman:

“And I also obviously stopped drinking because I was still drinking because I didn’t know I was pregnant, and also at the time I was still smoking because I hadn’t realised I was pregnant, so I stopped smoking as well.”

Hester

Hester also described looking for information on which foods she “wasn’t allowed to eat” as one of the first actions she took after discovering her pregnancy. Like all of the women, Hester expected that she would need to make dietary or physical activity changes because of her pregnancy. Her language suggests that these changes were non-negotiable, that certain restrictions would be imposed upon her. Again this is evidence that these women are passively adopting a pregnancy lifestyle, either based on their own intuition or by reproducing their perception of how a pregnant woman behaves. This is reinforced by women talking about making decisions about food or physical activity based on what they knew was “good for pregnancy” or what they felt they should do. This knowledge about pregnancy had mostly been passively acquired through witnessing others’ pregnancies. For example, this extract from Lizzie demonstrates how she had not actively sought information in preparation for her own pregnancy but had an awareness of the ‘do’s and don’ts’ from others’ experiences;

Lizzie: And I knew before I got pregnant there were some things that I wouldn’t be able to eat, and things like that, which I guess you...

Interviewer: Where did you get that kind of information from?

Lizzie: I don't know, from pregnant friends. I think through my job as well, 'cause I'm a youth worker and I support a young parents' group. I learnt quite a lot from spending time with them.

Lizzie's description indicates that she viewed these dietary changes as necessary or universal, hence there was no active decision-making on her part. Use of the words "knew" and "wouldn't" demonstrate an acceptance of, and readiness for, this pregnancy lifestyle, which is then triggered by the positive pregnancy test.

The onset of "feeling pregnant" had little influence on the women's lifestyle choices. Behavioural patterns established in early pregnancy were mostly maintained. While several women described relief and/or excitement at overcoming the most vulnerable first trimester and an acceptance of their new maternal reality, their thoughts tended to shift towards the birth and beyond, imagining their future life with their new baby. Several women described plans for their post-natal lifestyle, such as returning to their preferred physical activities, enjoying foods they were currently denying themselves and even how they would encourage a healthy lifestyle in their child. However there was no mention of deliberate changes in behaviour as a result of this acceptance that the pregnancy would likely be successful.

Influence of pre-conception experiences

Some women had experienced difficulties in conceiving, and Jo and June had both undergone fertility treatment. The extended time taken to conceive (and in some

cases significant intervention required) resulted in an increased awareness of the fragility of their own body and the role of their lifestyle choices in achieving their goal of motherhood. For example, both Jo and June had switched to decaffeinated drinks while trying to conceive. These women also experienced increased anticipation of pregnancy during the wait for conception. This gave these particular women more time to imagine, research and prepare for a future pregnancy, hence their 'pregnancy lifestyle' had become quite concrete in their minds. On the other hand, the women who had conceived relatively easily had not thought ahead to their pregnancy. Thus the amount of time and effort involved in becoming pregnant seems closely linked to the amount of information-seeking, both in preparation for and during pregnancy. Furthermore, this level of active preparation indicated the likelihood of deliberate lifestyle choices undertaken during pregnancy. The extracts below demonstrate this. Kat had not fully engaged with the advice on unsafe foods, showing limited interest and understanding of the topic, whereas Jo, who had struggled to conceive, had researched the recommendations on unsafe foods in considerable detail.

Interviewer: But generally pregnant women say to me, "Oh I know what I shouldn't eat." There's like a list of stuff that you shouldn't eat when you're pregnant. Were you aware of that?

Kat: Yeah, because when I first met the midwife she read out a list of stuff that you shouldn't eat; pâté, anything with raw egg in it, that sort of thing. But I mean I did used to like pâté but obviously I've just not had any. I eat eggs as long as they're well cooked[...] but yeah, so I haven't really sort of paid massive focus.

“There’s lots of different information in terms of diet, what you can, can’t eat. And I’ve got the basic information off the midwife, and after the midwife says, “Oh, you’re fine with most things as long as you avoid, you know, pates and the cheese.” But having gone on the N.H.S. website, there’s a whole extra list of other things. Then you look at... you Google it and you come up with the Australian website, which has three times as many things on there.”

Jo

For Jo, her struggles to conceive had primed her for making lifestyle changes which could influence the outcome of the pregnancy, and she threw herself into researching and implementing these immediately upon becoming pregnant. Importantly, despite showing less understanding of and concern regarding potential risks associated with certain foods, Kat says she “obviously” followed the advice. Hence, adhering to recommended behaviour changes seems for some women not to be a result of careful consideration of the potential risks and benefits but instead compliance with behaviour considered to be a normal part of being pregnant. These women may wish to be seen as a ‘good mother’, and these changes are an external demonstration of caring for their baby. Additionally, these changes could be a way of connecting with their new identity, accelerating the process of acceptance of the pregnancy by “acting like a pregnant woman” (Kat).

Listening to your body versus following advice

Many of the women described “listening to their body” when it came to making decisions about diet and physical activity. This was explained by some of the women as responding to what they felt their body needed, e.g. rest, energy, calcium from

dairy foods etc. These signals often appeared to direct women towards the most comfortable or enjoyable option even if these were contrary to advice given.

The following extract from Hester demonstrates how she sought to identify a way of engaging in physical activity that accommodated her fatigue and felt lack of energy. She wished to continue with “good” exercise but was unable to maintain her pre-pregnancy activities. Swimming offered the alternative she needed.

“So I knew that it was a good exercise to do and I also knew that it was good to do while I was pregnant. And because I enjoy it I thought at least that way I can still get some exercise. And also [husband] came with me as well, we try and go together if we can, we don't always manage it.”

Hester

This illustrates Hester’s readiness to adapt to exercise methods deemed appropriate for pregnancy. However, it is notable that her enjoyment of the activity and sharing it with her husband were important in the choice she made. Indeed, despite carefully choosing this activity she sometimes failed to meet her goal of swimming twice per week. This indicates that decisions made about exercise no longer focused purely on fitness or health benefits but issues of well-being and precaution to not ‘over-do it’ were considered. “Listening to your body” therefore meant taking heed of physical sensations experienced, and prioritising these over their objective, reasoned intentions.

In contrast to the women who were happy to be guided by their bodily signals or intuition, having received fertility treatment June and Jo demonstrated very deliberate decision-making with regard to their diet and physical activity behaviour. Despite their relatively in-depth knowledge and preparation for pregnancy, both women continued to seek detailed information from multiple sources on a range of subjects. This behaviour may be a manifestation of their anxiety and worry that they may somehow contribute to the loss of the pregnancy. Far from reducing their anxiety, this intensive research process often unearthed new sources of concern which then required further research, causing a negative cycle of information seeking and behaviour modification. Once they had decided on a course of action, they both adhered unwaveringly to these rules they had set for themselves. Even where there was a strong urge to eat something or do some activity they considered forbidden, they were able to overcome this, effectively 'tuning out' their body's signals. For example, June describes being inactive as "it didn't feel normal to me, it didn't feel right." Yet she persisted with the advised restrictions on exercise.

This desire to continually minimise risk occupied their thoughts and decision-making throughout pregnancy, and impacted on all aspects of their lives.

"Absolutely terrifying. Because you're on tenterhooks the whole time. Everything you do, you think is this going to hurt the baby, is this going to cause me to lose it? Every time I went to the loo I was checking for blood."

June

Thus, this extensive knowledge-gathering and adherence to advice regardless of urges to act differently enabled these women to feel that they were fulfilling their maternal responsibility as the sole protector and life-giver to their unborn child.

Retaining Self versus Selflessness

Another aspect of women's accounts of their behaviour and decision-making during pregnancy is the struggle between the desire to protect and nurture the unborn baby and the desire to continue with their lives and retain their identity while pregnant. Jo, June and Scarlett, who had all struggled to conceive, demonstrated a willingness and ability to almost entirely put their own needs and desires aside during pregnancy. They used the term "sacrifice" often and Jo described certain foods and drinks as being "pulled" from her. Prioritising the baby's needs often resulted not only in decreased pleasure but in increased discomfort and poorer overall well-being (e.g. body dissatisfaction, loss of fitness). This 'better safe than sorry' approach was embedded in a deep sense of responsibility for the foetus, influenced by their knowledge of how difficult a pregnancy can be to achieve and sustain. Jo talked of wanting peace of mind and to know that if anything did go wrong it could not be attributed to her actions;

"Peace of mind, you know. If I haven't had anything, there's no harm in anything at all. But if I've had, you know, one cup of coffee a day, is that too much? Has that caused a problem? Don't know."

Jo

June expressed similar thoughts regarding doing everything in her power to safeguard her pregnancy:

“Yes, well again, it was really just things like, because when they give you the result you’re obviously very, very early stages, and that’s at the time when you know that the pregnancy’s at its most vulnerable. And obviously having lost a couple in early pregnancy before, I was even more kind of paranoid about making sure that I didn’t do anything that could possibly put it at risk.”

June

Hence, despite expressing frustration that she had been advised to restrict her physical activity to walking and swimming instead of her usual higher intensity activities, June never considered ignoring this advice. As previously mentioned, these extracts also demonstrate that for these women anxiety and worry is an integral part of their new maternal identity.

In contrast, both Lizzie and Kat talked about not wanting their pregnancy to take over their lives:

“And some people are really, really... I mean, I’m not... I’m not really strict on things that the midwife says, you know. I don’t like prawns, but if I was to eat a prawn it wouldn’t be the end of my world. Whereas, some people are just checking ingredients for everything.”

Lizzie.

“There’s a balance because I don’t want to make it all about the baby because...and this is going to sound awful to people who are pregnant and their whole life is about the baby, I think people become very obsessed about baby, baby, baby.”

Kat

Both women's descriptions present their actions as different to what 'others' do and hence they had rejected the construction of the pregnant woman as someone whose thoughts and actions are consumed by her pregnancy. As such, the relatively low attention these women paid to pregnancy-related information and the lack of deliberate adjustments to their lifestyle related to their pregnancy is congruent with their desire to retain their self-identity and not let pregnancy dictate their actions.

Both Hester and Tess exhibited motivation to modify their lifestyle in order to protect their baby but also talked of balancing this desire with satisfying their own needs, particularly with regard to food and drink choices. An example of the struggle of retaining elements of the non-pregnant lifestyle while also safeguarding the pregnancy comes from Hester. Hester's accounts of her life before and during pregnancy often included eating out in restaurants and visiting pubs, and she describes where she lives as having a social culture based around pubs and alcohol. Although she described occasions where she would normally have drunk alcohol before her pregnancy but had rejected it while pregnant, she also mentioned sometimes having a small glass of wine, when she "*really*" wanted one;

"Yeah, I have had the occasional glass of wine, one or two a week, small glasses, if I feel like it, if I'm out, if we're out for dinner with friends or something but I generally don't bother unless I really fancy one."

This suggests that for her total abstinence is not necessary, and when desires are sufficiently strong she can pay attention to them. Although current advice in the UK recommends avoiding alcohol consumption, drinking small amounts infrequently after the first trimester is considered to be safe (National Institute for Health and Care Excellence, 2008). Yet abstinence is the norm among this sample of women and Hester herself initially abstained, suggesting that her later consumption of alcohol is a rejection of the construction of a pregnant woman as someone who treats her body like a temple, eliminating all toxins. Similarly, Hester described researching and discussing the advice she was given to not eat rare steak, including consulting a chef and restaurant manager. She concluded that it would be safe to have her steak cooked rare, but admitted she did have it cooked slightly more than she would have done pre-pregnancy. These examples demonstrate a partial acquiescence to the role of the pregnant woman as one who prioritises the foetus, while also partially fulfilling her own needs. As such this more balanced approach to making lifestyle choices reflects Hester's maternal identity as someone who prioritises her baby's safety but is not driven by worry and anxiety and therefore she can still enjoy socialising, eating and drinking.

However, for some women there was more of a sense of loss of their pre-pregnancy self. For example, when Kat spoke about making significant changes to her diet and exercise, she used words like "had to change", suggesting that the adoption of a more selfless mother identity was not entirely voluntary, and this had resulted in a more difficult adjustment to her shifting priorities. She refers to putting "this" first, rather than naming the pregnancy or baby, indicating some resentment towards the pregnancy as a result of the changes she feels were inflicted upon her.

“And that’s what I’ve found hardest to deal with, to be honest. I still want to do it. It’s not through not wanting to, but I just don’t feel I can. And I’m finding that hard because my life for about the last ten or fifteen years has just been solid exercise and it’s been all about me. I’ve probably had to change from being quite an independent and almost probably selfish because I’ve even put exercise before other things in my life now and I’ve had to change now to be putting this first rather than what I want to do. So that’s what I’ve probably found hardest to deal with.”

Kat

As mentioned earlier, women made changes to diet and physical activity long before they had psychologically adjusted to their status as a pregnant woman or mother. Therefore, rather than being an abandonment of their previous self, these changes could also be a means of developing their self-identity to include a maternal role.

Discussion

The present study used in-depth qualitative methods to examine how women experiencing their first pregnancy made decisions about their diet and physical activity behaviours. Four themes emerged during analysis. *Acceptance of the pregnancy* related to the process of an initial rational acceptance of pregnancy and a later deeper adoption of a new mother identity. *Influence of pre-conception experiences* related to how women who had experienced difficulties conceiving engaged more with diet and physical activity advice. *Listening to your body versus following advice* demonstrated how women balanced the advice they received with

their physical sensations and urges. Finally, *retaining self versus selflessness* demonstrated the struggle between being a good mother and the desire to preserve some of their non-pregnant identity.

The present study is the first to specifically examine the decision-making process regarding diet and physical activity during pregnancy through asking women to describe examples of times they had encountered information and chose a plan of action, and to examine the reasons for sticking to or failing to carry through their intentions. Whereas much of the previous qualitative work on these behaviours in pregnant women employed more manifest-level analysis, the use of IPA in the present study provided deeper insight into the important influences on their choices and behaviour. Additionally, some previous studies (e.g. Hegaard et al., 2010; Nicholson et al., 2010) have collected data after pregnancy had ended, whereas our participants were interviewed while still experiencing the phenomenon being studied. This is a strength of the present study, as women's recall of their experiences may change as those experiences become less recent and viewed through the lens of their new mother identity. The participants in our study were similar in age, socioeconomic level and relationship status, in line with recommendations by Smith, Flowers & Larkin (2009) to recruit a homogenous sample. As such our findings may not be relevant to women who differ on these characteristics. The role of pre-conception experiences in determining women's diet and physical activity beliefs and behaviour had not been considered a priori, hence women who had received fertility treatment were not excluded from the study. However, the stark contrast in approaches to diet and physical activity between the two women who had received fertility treatment and those who had not, was advantageous in illuminating the

constructs of the TM model, and therefore their experiences were not excluded post-hoc.

The women in our study implemented immediate changes to their diet and physical activity behaviour in response to discovering their pregnancy. This adoption of a new pregnancy-based lifestyle facilitated the development of their new mother identity and served as an outward demonstration of their commitment to being a good mother. Similar findings were observed by Copelton (2007) although these related only to nutritional changes in women who had read specific pregnancy advice books. Our findings suggest that similar processes are at work with regard to physical activity and in women who had not engaged with similar literature. However, in contrast to Copelton's (2007) findings, the women in the present study did not express feelings of guilt when engaging in diet and physical activity behaviours which were contrary to recommendations or social norms, nor did they put their own preferences aside in favour of what was best for their baby. Rather, similar to the findings of Wennberg, Lundqvist, Hofberg, Sandstrom & Hamberg (2013), the women in our study justified these behaviours as a means to preserve some of their pre-pregnancy identity and prevent their lives becoming consumed by their impending motherhood.

The women in our study were primed and ready to make changes to their diet and physical activity once they became pregnant, as a result of witnessing other women's pregnancies. However most women had not engaged in research or planning for these changes, hence their immediate decisions following their positive pregnancy test were mostly non-reflective, based on instinct and replicating the

behaviours they had seen adopted by others. Previous authors have suggested that women actively seek out expert advice, particularly from health professionals, as part of their transition to motherhood (Miller, 2005). By contrast, for most of the women in our study information seeking was often limited to checking that their perceptions of appropriate diet and physical activities were correct, and clarifying the exact details of any restrictions. As a result their exposure to broader health messages about the importance of being physically active and eating a nutritious diet was low and their behavioural choices were not always well-informed.

Most of the women in our study trusted their bodily signals above all else. These physical sensations were used to justify diet and physical activity behaviours which were contrary either to the recommendations of health professionals or societal expectations. In addition to previously suggested barriers to physical activity and healthy eating in pregnancy such as food cravings (Copelton et al., 2007), fatigue and nausea (Weir et al., 2010) the present findings suggest that a more broad-spectrum belief exists that the body knows best, and will provide the necessary indications for the pregnant woman to respond to. This is linked to the women's belief that every woman, body and pregnancy is different, and as such general recommendations and advice cannot be as reliable or trustworthy as their own feelings. This faith in their own bodily signals was generally reinforced by a lack of any noticeable negative consequences for themselves (such as illness or pregnancy complications), and an increase in well-being from responding to their physical sensations, for example by avoiding physical activity or eating unhealthy foods. As a result, their early diet and physical activity choices became established behaviour patterns.

Furthermore, our findings suggest a strong social influence on women's diet and physical activity behaviour. Not only do these women initially base their choices on replicating the social construction of a pregnant woman, but they appear to meet few challenges to their perceived view of what is "good for pregnancy" from those close to them. In contrast to a behaviour like smoking, behaviours such as eating chocolate or giving up exercise during pregnancy are much more socially acceptable, suggesting that they behaviours are perceived as either positive or low risk by society as a whole. In fact, the women who were physically active during their pregnancy faced some criticism of their active lifestyle from family members, causing them to question their positive choices. As a result, within our sample of relatively health-conscious, physically active women, far from being viewed as an opportunity to adopt healthier diet and physical activity behaviours, pregnancy was viewed as a time when they could take a break from their usual healthy lifestyle without fear of criticism.

The experiences of women who had received fertility treatment demonstrated a markedly different approach to diet and physical activity decision-making. For these women the previous failure of their bodies to achieve or sustain pregnancy had led them to no longer trust their physical sensations and bodily signals. They had achieved their goal of pregnancy by placing their trust in the medical profession and making changes to their lifestyle to increase their fertility. As a result, during pregnancy they were committed to searching out and adhering to credible advice on diet and physical activity. Their increased sense of vulnerability meant they were not willing to simply copy others' behaviour or rely on their instinct. Unlike the other

women in the study the women who had received fertility treatment completely sacrificed all self-fulfilment as a means of reassuring themselves that they were doing everything within their control to protect and sustain the pregnancy.

The contrasting experiences and behaviour of the women who received fertility treatment prior to pregnancy, and those who did not, provide some support for the TM model. It seems that the women who received fertility treatment experienced different, and more amplified, affective responses, risk perceptions and changes in self-concept than those who conceived with relative ease (see Table 2). This may explain why these women engaged much more intensively with information-seeking and adhered much more closely to advice on diet and physical activity than the other women. For example, these women predominantly described negative emotions such as fear and paranoia. It is also possible, having experienced disappointment and loss during their attempts to become pregnant, that these women experienced a heightened emotional response to achieving a viable pregnancy. Similarly, the experience of fertility treatment had given these women a much greater awareness of the vulnerability of their pregnancy, and their adherence to diet and physical activity advice was a means of minimising this risk and continuing to place their trust in the medical profession. Finally, these women used behaviour change as a means to be a good mother, and to protect their self-esteem by assuring themselves they had done everything possible to protect the foetus.

In contrast, the women who had not required fertility treatment used less emotive language, and expressed few strong emotions, either negative or positive when describing their pregnancy experiences. These women also felt no need to engage in risk-reducing strategies. They saw pregnancy as natural, and expected everything

to be okay, as it had been for the majority of women they knew who had experienced it, and this belief was reinforced by the healthy progression of their pregnancy to date. Additionally, non-adherence to advice on a healthy diet and regular physical activity posed no threat to these women's self-esteem, as small indulgences and low activity were often supported by partners and family members, as well as society in general.

In addition to identifying some possible explanations for low levels of adherence to antenatal dietary and physical activity recommendations with regard to the psychological responses to the cueing event of pregnancy, a novel finding of our study is the significant influence of non-reflective or impulsive processes on lifestyle behaviours among the women with a 'normal' conception and pregnancy experience. The women who had not received fertility treatment described their behavioural choices as "automatic" and "obvious" and there was little description of evaluating advice or weighing up the pros and cons of different actions. This is pertinent because an important element of the TM model is the suggestion that behaviour change is more likely during a TM if relevant health advice is provided at that time. However, this advice would require reflective processes to be engaged to evaluate the information provided and make decisions about implementing that advice. There are several possible explanations for these women's behaviour being driven primarily by impulsive processes. Strack & Deutsch (2004) proposed that high levels of arousal (such as might occur during a period of extreme life change) may disrupt reflective processes and lead to behaviour based on pre-existing behavioural schemata, such as associating specific behaviours with pregnancy. Subsequently, Hofmann, Rauch & Gawronski (2007) demonstrated that eating behaviour was predicted by automatic attitudes when self-regulation resources were low. The

women in our study may have depleted self-regulation resources due to adhering to other behaviour changes such as abstaining from alcohol or taking vitamins, or due to emotional regulation, especially in the early stages of adjusting to their new pregnant reality. Similarly, Friese, Hofmann & Wanke (2008) demonstrated that people under cognitive load follow their impulses more strongly when making food choices. As the women in our study were experiencing pregnancy for the first time they were having to acquire a lot of new knowledge, and 'information overload' during antenatal appointments is commonly reported (Olander et al., 2011).

Additionally, there is evidence to suggest that individuals in a positive mood may rely more heavily on their associative network for information processing than those in a negative mood (Hofmann, Friese & Weirs, 2008). The women in our study who had not experienced fertility treatment had no significant worries or anxieties and were generally positive about their pregnancy and the prospect of motherhood.

Future research should not only seek to establish whether our findings are generalizable to other women experiencing a normal pregnancy, but also to identify which factors predict the impulse-behaviour relationship in this context. A greater understanding of the circumstances which lead to a reliance on non-reflective processes will be invaluable in informing future health promotion and behaviour change interventions in pregnancy. Traditionally such interventions primarily target reflective processes by aiming to increase women's perceptions of the benefits of a healthy diet and regular physical activity to stimulate a positive evaluation of the recommended behaviours. However, our initial findings suggest that interventions may need to go further, either to create the necessary conditions to enable women to access their reflective processes, or to influence the impulsive precursors to behaviour, such as the pre-learned association between pregnancy and certain

behaviours. Clearly before any such interventions are developed, it is vital that the views and experiences of health professionals working with pregnant women are explored to further increase our understanding of how women respond to health advice during this important life stage.

Conclusion

Our findings challenge the assertion that pregnancy is a good time for behaviour change premised on an assumption that motivation towards health will make women more likely to engage with relevant health advice and make changes to their health behaviours. In women who had experienced an uncomplicated conception and pregnancy, the necessary conditions to create a TM may not exist. Diet and physical activity choices among these women were mostly non-reflective and although they had both sought and received health-related information from trusted sources, this had little influence on their diet and physical activity. New strategies may be needed to promote positive diet and physical activity behaviours that go beyond information provision.

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Table 1 – Participant biographies

Lizzie was very relaxed about her pregnancy, she viewed pregnancy as part of normal life so did not feel the need to make drastic changes to her lifestyle. She did very little information-seeking and avoided potential sources of negative stories such as magazines and TV programmes. (Overweight at booking appointment).

Jo had fertility treatment before conceiving and was told her pregnancy was high-risk. Jo had undertaken very extensive information-seeking throughout her pregnancy, checking multiple sources and investigating many aspects of her lifestyle. (Healthy weight at booking appointment).

Tess was very interested in pregnancy and baby-related information and accessed this through a wide variety of channels. However most of her lifestyle choices during pregnancy were based on how she felt and just a few sources of expertise such as her midwife and close friends and family. (Overweight at booking appointment).

Kat was very physically active and ate very healthily before pregnancy, but she suffered with severe nausea and fatigue from the start of pregnancy which affected her ability to continue her normal lifestyle. Kat felt that pregnancy was not the “be all and end all” and she had done less purposive information-seeking than some of the other women, stating that she thought some women could become “obsessed” with their pregnancies and babies. (Healthy weight at booking appointment).

Scarlett and her partner had been trying to conceive for around a year before she

became pregnant and Scarlett is the last of her friends to have children. Scarlett was a regular runner and gym-goer and had mostly continued with her physical activity routine during her pregnancy. Scarlett had accessed multiple information sources but most highly valued the advice from her midwife and personal experiences of close friends. (Healthy weight at booking appointment).

June had received extensive fertility treatment before conceiving, and had already made significant lifestyle changes during her attempts to become pregnant. June sought information from multiple sources and carefully considered every detail of her lifestyle both before and during her pregnancy. Being physically active was very important to June but she had reduced her activity levels both during fertility treatment and upon becoming pregnant. (Overweight at booking appointment).

Hester was in her 40s before she and her partner began to try for a baby and she was surprised to conceive quite quickly. Aside from her midwife, Hester sought most of her information from internet sources. Hester had a busy social life prior to pregnancy, often visiting local pubs and restaurants and she was keen to continue to enjoy this during her pregnancy. (Overweight at booking appointment).

Table 2 – Summary of the differences in the Teachable Moments constructs between women who had and had not received fertility treatment.

	Women who did not receive fertility treatment	Women who received fertility treatment
<i>Emotion/Affective response</i>	'Knew' they were pregnant, but did not 'feel' pregnant.	High levels of fear, anxiety & worry. More emotionally invested in pregnancy due to previous disappointment & loss.
<i>Perceived risk/Outcome expectancies</i>	Awareness of the benefits of behaviour change but minor deviation from recommendations not considered risky. Limited information seeking and some women actively avoided information. Belief that their body knows best, reinforced by healthy progression of pregnancy.	Behaviour driven by desire to minimise risk. Their body cannot be trusted, it has let them down by not achieving pregnancy without assistance. Medical professionals can be trusted, their intervention helped to achieve the pregnancy.
<i>Change in social role/self-concept</i>	Commitment to being a good mother, but no guilt for non-compliant behavior and no social stigma attached to indulgent food or reducing activity. Progression to a mother identity ongoing, they identify as 'pregnant'. Non-compliant behaviours are a means to preserve non-pregnant identity.	Behaviour change is a means to protect self-esteem – if anything goes wrong it cannot be their fault. Extended time & effort working towards motherhood may mean a greater change in social role towards a mother identity has taken place.

Appendix 1

Procedure for interviews

The following procedure will be used to initiate discussions and to guide participants to describe specific experiences in detail. The mapping exercise aims to keep the interview focussed on the participant's experience, their relationships, their life, therefore fulfilling the idiographic commitment of IPA. This should result in a thick description, i.e. a detailed account of the person's life in context and therefore a detailed description of the phenomenon to be examined.

Introduction/Rapport building

Remind participant about confidentiality and that they don't have to talk about anything they don't feel comfortable with.

Ask the participant to describe the moment they found out they were pregnant. If necessary, prompt about how they felt, who they told, what they did etc. Lead into...

Examples of dietary advice and choices

Ask participant to describe a time when they received information or advice during their pregnancy (or post-natally, depending on time of interview) regarding their diet. Following initial description of the event, prompt the participant to describe in detail how they came to receive the advice, how they felt during and afterwards, and how and why the advice had influenced their diet.

Additional examples may also be sought and explored if the participant is willing.

Examples of physical activity advice and choices

Ask the participant to describe a time when they received information or advice during their pregnancy (or post-natally, depending on time of interview) regarding their physical activity. Following initial description of the event, prompt the participant to describe in detail how they came to receive the advice, how they felt during and afterwards, and how and why the advice had influenced their physical activity.

Additional examples may also be sought and explored if the participant is willing.

Map of information sources

In order to establish all the sources of information and advice the participant has accessed, ask the participant to draw a map of all these sources, indicating their relative importance or influence by their distance to themselves. Other than these instructions, do not prompt as to possible sources. Once the map is drawn, suggest alternative sources of information and ask the participant to place these sources on the map, if appropriate. Ask the participant to explain their positioning of each source, in order to understand why some sources are seen as more important than others.

An example might look something like this:

